CLAIMS

What is claimed is:

1. An apparatus for detecting the position of an object in one or more images captured by an image pickup device mounted on a vehicle, comprising:

(a) a memory on which is stored a plurality of images captured by the image pickup device, including a first image of an object taken at a first time when the vehicle is balanced and a second image of the object captured at a second time; and

(b) a controller operatively coupled to the memory and adapted to determine whether the second image was captured when the vehicle was not balanced, and to determine the position of the object in the second image based on the position of the object in the first image if the second image was captured when the vehicle was not balanced.

2. The apparatus of claim 1, wherein the controller is further adapted to compute the image acceleration of the second image; and to determine that the second image was captured when the vehicle was balanced if the image acceleration is zero.

3. The apparatus of claim 2, wherein the controller is further adapted to compute the vertical image velocity of the second image, and to determine that the second image was captured when the vehicle was balanced if the second image has a zero image acceleration and a non-zero vertical image velocity.

4. The apparatus of claim 1, wherein the memory includes a third image of the object captured at a third time when the vehicle was balanced, and wherein the controller is further adapted to determine the position of the object in the second image based on the position of the object in the first image and in the third image.

5. The apparatus of claim 1, wherein the controller is further adapted to compute the size of an object in the second image based on the size of the object in the first image if the second image was captured when the vehicle was not balanced, and to compute the distance between the image pickup device and the object based on the computed size of the object.

6. The apparatus of claim 5, wherein the controller is further adapted to compute the vision axis of the image pickup device based on the computed distance if the second image

was captured when the vehicle was not balanced, and to compute the position of the object in the second image based on the computed vision axis.

7. A vehicle, comprising:

(a) an image pickup device mounted on the vehicle to capture a plurality of images of at least one object;

(b) a memory on which is stored the plurality of images captured by the image pickup device, including a first image of an object taken at a first time when the vehicle is balanced and a second image of the object captured at a second time;

(c) a controller operatively coupled to the memory and adapted to determine whether the second image was captured when the vehicle was not balanced, and to determine the position of the object in the second image based on the position of the object in the first image if the second image was captured when the vehicle was not balanced.

8. The vehicle of claim 7, wherein the controller is further adapted to compute the image acceleration of the second image; and to determine that the second image was captured when the vehicle was balanced if the image acceleration is zero.

9. The vehicle of claim 8, wherein the controller is further adapted to compute the vertical image velocity of the second image, and to determine that the second image was captured when the vehicle was balanced if the second image has a zero image acceleration and a non-zero vertical image velocity.

10. The vehicle of claim 7, wherein the memory includes a third image of the object captured at a third time when the vehicle was balanced, and wherein the controller is further adapted to determine the position of the object in the second image based on the position of the object in the first image and in the third image.

11. The vehicle of claim 7, wherein the controller is further adapted to compute the size of an object in the second image based on the size of the object in the first image if the second image was captured when the vehicle was not balanced, and to compute the distance between the image pickup device and the object based on the computed size of the object.

12. The vehicle of claim 11, wherein the controller is further adapted to compute the vision axis of the image pickup device based on the computed distance if the second image was captured when the vehicle was not balanced, and to compute the position of the object in the second image based on the computed vision axis.

13. An apparatus for detecting the position of an object in one or more images captured by an image pickup in a vehicle, comprising:

image judgment means for determining whether a first image of an object captured by an image pickup was captured when the vehicle was balanced; and

object position computing means for determining the position of an object in the first image if the first image was captured when the vehicle was not balanced, which determination is based on a second image of the same object that was captured when the vehicle was balanced.

14. A method for detecting the position of an object in an image captured by an image pickup in a vehicle, comprising:

determining whether a first image of an object captured by an image pickup was captured when the vehicle was balanced; and

determining the position of the object in the first image if the first image was captured when the vehicle was not balanced, which determination is based on a second image of the same object that was captured at which the vehicle was balanced.

15. The method of claim 14, further comprising determining the image acceleration of the first image; wherein the vehicle is determined to be in balance if the first image acceleration is zero.

16. The method of claim 15, further comprising determining the vertical image velocity of the first image; wherein the vehicle is determined to be in balance if first image has a zero image acceleration and a non-zero vertical image velocity.

17. The method of claim 14, further comprising providing a third image of the of the object captured when the vehicle was balanced, and wherein the position of the object in the first image is determined based on the position of the object in the second image and in the third image.

18. The method of claim 14, further comprising computing the size of an object in the first image based on the size of the object in the second image if the first image was captured when the vehicle was not balanced, and computing the distance between the image pickup device and the object based on the computed size of the object.

19. The method of claim 18, further comprising computing the vision axis of the image pickup device based on the computed distance of the object, if the first image was captured when the vehicle was not balanced, and computing the position of the object in the first image based on the computed vision axis.